

means of determining relative degrees of intensity with accuracy in future researches.

645. I have already expressed the view which I take of the decomposition in the experimental place, as being the direct consequence of the superior exertion at some other spot of the same kind of power as that to be overcome, and therefore as the result of an antagonism of forces of the *same* nature (626, 639). Those at the place of decomposition have a re-action upon, and a power over, the exerting or determining set proportionate to what is needful to overcome their own power; and hence a curious result of *resistance* offered by decompositions to the original determining force, and consequently to the current. This is well shown in the cases where such bodies as chloride of lead, iodide of lead., and water would not decompose with the current produced by a single pair of zinc and platina plates in sulphuric acid (638), although they would with a current of higher intensity produced by stronger chemical powers. In such cases no sensible portion of the current passes (702); the action is stopped; and I am now of opinion that in the case of the law of conduction which I described in the second part of these Researches (149), the bodies which are electrolytes in the fluid state cease to be such in the solid form, because the attractions of the particles by which they are retained in combination and in their relative position, are then too powerful for the electric current. The particles retain their places; and as decomposition is prevented, the transmission of the electricity is prevented also; and although a battery of many plates may be used, yet if it be of that perfect kind which allows of no extraneous or indirect action (736), the whole of the affinities concerned in the activity of that battery are at the same time also suspended and counteracted.

646. But referring to the *resistance* of each single case of decomposition, it would appear that as these differ in force according to the affinities by which the elements in the substance tend to retain their places, they also would supply cases constituting a series of degrees by which to measure the initial intensities of simple voltaic or other currents of electricity, and which, combined with the scale of

intensities determined by
different degrees of *acting force* (644),
would probably include
a sufficient set of differences to meet
almost every important
, case where a reference to intensity
would be required.

647. According to the experiments
I have already had occa-
sion to make, I find that the following
bodies are electrolytic